

REMARKS

Metallic Glass Alloy vs. Amorphous Alloy

The Examiner indicates that Applicant's discussion of the difference in definition between "metallic glass alloy" and "amorphous alloy" has been accorded little, if any, weight because no evidence such as prior art references in support have been provided.

Applicants submit for the Examiner's reference some articles which indicate the difference between "metallic glass alloy" and "amorphous alloy."

Rejections under 35 USC §112, Second Paragraph

Claims 1 and 2 were rejected under 35 USC §112, second paragraph, as failing to comply with the written description requirement.

The Examiner alleged that "The new claim language, 'wherein said glass alloy product as cast has minimum thickness or diameter of 0.5 mm or more' (claim 1, line 13) does not find support in the application as filed and therefore is new matter."

However, "wherein said glass alloy product as cast has minimum thickness or diameter of 0.5 mm or more" has support in the disclosure as filed. More specifically, Table 1 shows inventive examples 1-14, diameters of which are 0.5 mm or more and compares with comparative examples with diameter of 0.5 mm.

The fact clearly indicates that Applicant considered glass alloy product as cast having minimum thickness or diameter of 0.5 mm or more" as his invention.

Rejections under 35 USC §103(a)

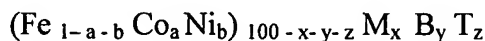
Claims 1 and 2 were rejected under 35 USC §102(b) as anticipated by or, in the alternative, under 35 USC §103(a) as being obvious over Inoue et al. (U.S. Patent No. 5,976,274).

The Examiner alleges that Inoue et al teaches an amorphous alloy having a composition that overlaps the alloy composition recited in the applicants' claims. The present claim 1 recites the composition formula as follows:



wherein each of a, b and n represents an atomic ratio satisfying the following relations: $0.1 \leq a \leq 0.17$; $0.06 \leq b \leq 0.15$; $0.18 \leq a + b \leq 0.3$; and $0 \leq n \leq 0.08$, M represents one or more elements selected from the group consisting of Zr, Nb, Ta, Hf, Mo, Ti, V, Cr, Pd and W, and χ satisfies the following relation: $3 \text{ atomic\%} \leq \chi \leq 10 \text{ atomic\%}$.

On the other hand, Inoue et al discloses the soft magnetic amorphous alloy as follows:



wherein $0.1 \leq a \leq 0.29$, $0.1 \leq b \leq 0.43$, $5 \text{ atomic \%} \leq x \leq 15 \text{ atomic \%}$, $10 \text{ atomic \%} \leq y \leq 22 \text{ atomic \%}$, $0 \text{ atomic \%} \leq z \leq 5 \text{ atomic \%}$, M is at least one element of Zr, Nb, Ta, Hf, Mo, Ti and V, and T is at least one element of Cr, W, Ru, Rh, Pd, Os, Ir, Pt, Al, Si, Ge, C and P.

(Column 3, lines 7-14). The following Table shows comparison of the composition of present invention and Inoue et al.

Table. Comparison Between Present Invention and Inoue et al

Present Invention		Inoue et al.	
$[Co_{1-n-(a+b)} Fe_n B_a Si_b]_{100-\chi} M_\chi$		$(Fe_{1-a-b} Co_a Ni_b)_{100-x-y-z} M_x B_y T_z$	
Element	at %	Element	at %
Co	Remainder	Co	0.58**-29
Fe	0-8	Fe (only when b=0)	Remainder (41.18**-84.15***)
B	9*-17	B	10-22
Si	5.4*-15	T (Cr, W, Ru, Rh, Pd, Os, Ir, Pt, Al, Si, Ge, C, P)	0-5
M (Zr, Nb, Ta, Hf, Mo, Ti, V, Pd, W)	1-10	M (Zr, Nb, Ta, Hf, Mo, Ti, V)	5-15

* The lower limit has been calculated on the assumption that $\chi=10$.

** The lower limit has been calculated on the assumption that $x=15$, $y=22$, and $z=5$.

*** The higher limit has been calculated on the assumption that $a=0.29$, $x=5$, $y=10$, and $z=0$.

In Inoue et al, Si is just an option from a group of as many as thirteen elements. Also, according to Inoue et al, the alloy contains Fe of as high as 41.18-84.42% while the present invention contains Fe of 8% at maximum. Also, all preferred compositions shown as examples contain Ni, which the present invention does not contain. Moreover, according to the present invention, the metallic glass alloy contains Si of 5.4-15% while in Inoue et al, the amorphous alloy contains Si of 5% at maximum. Thus, **there is no overlap**.

Furthermore, Inoue et al explains T group elements as follows:

At least one element of Cr, W, Ru, Th, Pd, Os, Ir, Pt, Al, Si, Ge, C and P, which is denoted by T, can be further added to the above composition system.

In the present invention, these elements can be added in the range of 0 to 5 atomic %. These elements are mainly added for improving corrosion resistance. **Out of this range, soft magnetic characteristics deteriorate, and also the ability to form an amorphous phase undesirably deteriorates.**

(Column 6, lines 44-48, emphasis added). Inoue et al clearly **teaches away** from adding these elements over 5 atomic %. Therefore, Inoue et al does not teach or suggest the soft magnetic Fe-B-Si based metallic glass alloy product as recited in claim 1.

For at least these reasons, claim 1 patentably distinguishes over Inoue et al. Claim 2, depending from claim 1, also patentably distinguishes over Inoue et al for at least the same reasons.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

Response After Final
Application No. 10/510,642
Attorney Docket No. 042756

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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Enclosures: Acta Materialia, 48 (2000), pp. 279-306.
MaterialsToday, March 2004, pp. 36-43.
JOM, May 2005, pp. 35-39

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